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Ron Barganz

INSPECTION NOTES

REYNOLDS METALS
(McCook)

Industrial Wastes Treatment

DATE

October 28, 1977

INTERVIEWED

R. W. Buhrmaster, Environmental Control Engineer

The industrial wastewater treatment facility serving the Reynolds Metals Company McCook Plant has been nominated for the Industrial Wastewater Treatment Plant of the Year Award. The inspection was conducted on this date to determine the current operating procedures, and to provide background information to the Engineers who will perform the inspection that will be used to determine which of the industrial plants will win the award.

There are three outfalls serving the entire facility. The East Outfall, 002, discharges non-contact cooling water and storm water runoff from parking lots and storage areas. All the water that discharges from this outfall passes through an oil skimming mechanism. The once-through cooling water, which discharges at a rate of about 125 to 150 gallons per minute, originates from an mixed inert gas generator which uses city water for cooling purposes.

The storm water and the cooling water enters a concrete structure equipped with a surface underflow weir which retains the floating oils , which are then collected with a vertical belt skimmer. Oil that is scraped from the rubber belt discharges into a tank whose contents are periodically removed by a scavenger. After passing under the weir the water passes into another compartment, and then out into the manhole via a pipe formed in a 90° angle pointed down. This arrangement should prevent oils from escaping from the final compartment. Observations were made at the outfall to Summit-Lyons ditch. The water discharging at the time was clear, however, minor traces of oil were observed floating at the surface and around stream vegetation. A snapping turtle was observed adjacent to the outfall, along with a number of carp and goldfish.

Industrial wastes and combined industrial-storm water flows are handled in the physical-chemical wastewater treatment facility. Flow comes into this plant in a 66" influent sewer. the average flow to the plant is 1.3 million gallons per day, however, they can handle up to approximately 1.7 million gallons per day. The sources of water entering the plant are several. It receives blowdown from recirculated cooling water, blowdown from the boiler house, chrome wastes from the paint line, and soluble oils from the rolling mills.

The chrome wastes which originate in the paint line result from the cleaning and etching of the aluminum stock prior to painting. This cleaning and etching

process utilizes chromic compounds. The aluminum components are water rinsed. This rinse water is discharged to the industrial treatment plant after receiving pretreatment with sulphur dioxide and pH adjusters.

Soluble oils from the rolling mill are discharged to the industrial wastewater treatment facility after being broken down by an acid. This breakdown process separates the soluble oil into a water phase and an oil phase. The oil phase is sold to a reclaiming company, while the water phase is dumped to the industrial waste water sewer.

The wet well serving the industrial wastewater treatment system is equipped with a trash gate to preclude large objects from the pumps. The wet well is equipped with a oil skimmer similar to the oil skimmer located at the East Outfall. The three new pumps are used to lift the industrial wastes to the scalping tanks. The three old pumps which were utilized prior to the upgrading of the plant, are kept on standby status.

The flow, prior to entering the scalping tanks, is pH adjusted with either sulfuric acid or lime. According to Buhrmaster, sulfuric acid is almost never used. The scalping tanks are equipped with surface oil skimmers, with the oil transported to the oil storage tank with screw conveyors.

Flow from the scalping tanks then enters the flocculator, where Ferric Sulfate (Ferri-floc) is mixed into the wastewater with two rotary mixers. After mixing a coagulant material from NALCO is added and then it flows to two chambers equipped with large paddles parallel to the axis of the flow.

The flow then enters the clarifier in an underfeed arrangement to the center distribution well. The skirt of the central well is approximately 8' deep according to Buhrmaster.

The surface of the final clarifier is skimmed with a rotating arm skimmer with the oil discharge to the oil tank. Sludge is discharged to the sludge holding tank and then transported to the quarry dump site. This quarry is located at the far northwest corner of the Reynolds property. This site was visually inspected. The sludge and other solid industrial wastes have been disposed of in this quarry for many years. At the present time a large portion of the quarry has been filled in.

Since the sewers receiving the industrial wastewater are of the combined type, two large holding ponds have been constructed in order to capture the first flush of combined industrial wastewater and storm water during precipitation. This diversion is accomplished by pumping the water from a diversion box on the sewer line. Two of the three 1500 gallon per minute pumps are used to pump to the pond. The third pump is utilized as a spare. After the rain fall the flow is returned to the treatment plant by manually controlling two valves. On occasion, during very intense rainfall episodes industrial wastewater and storm water are discharged to the ditch via Outfall 003. According to Buhrmaster such an overflow occurred once in August and once in September of this year.

The industrial wastewater treatment facility is operated 24 hours a day, seven days a week by a fully trained operator. The control room houses the Ferri-floc mixing tank, the control panel, the laboratory equipment, acid feed pumps, and sludge pumps. The only tests performed in the laboratory in the control building are chrome and pH. The lime and acid storage tanks are located outside the control building. While the plant is not equipped with an emergency power generating set, Buhrmaster said that shutdown is unlikely since the industrial wastewater treatment plant is provided with several power feeds. An emergency two million gallon capacity storage pond is also provided. According to Burhmaster this pond is normally utilized when the treatment plant is shut down for a cleaning and maintenance.

Michael J. Schmitt, Environmental
Protection Engineer, Maywood

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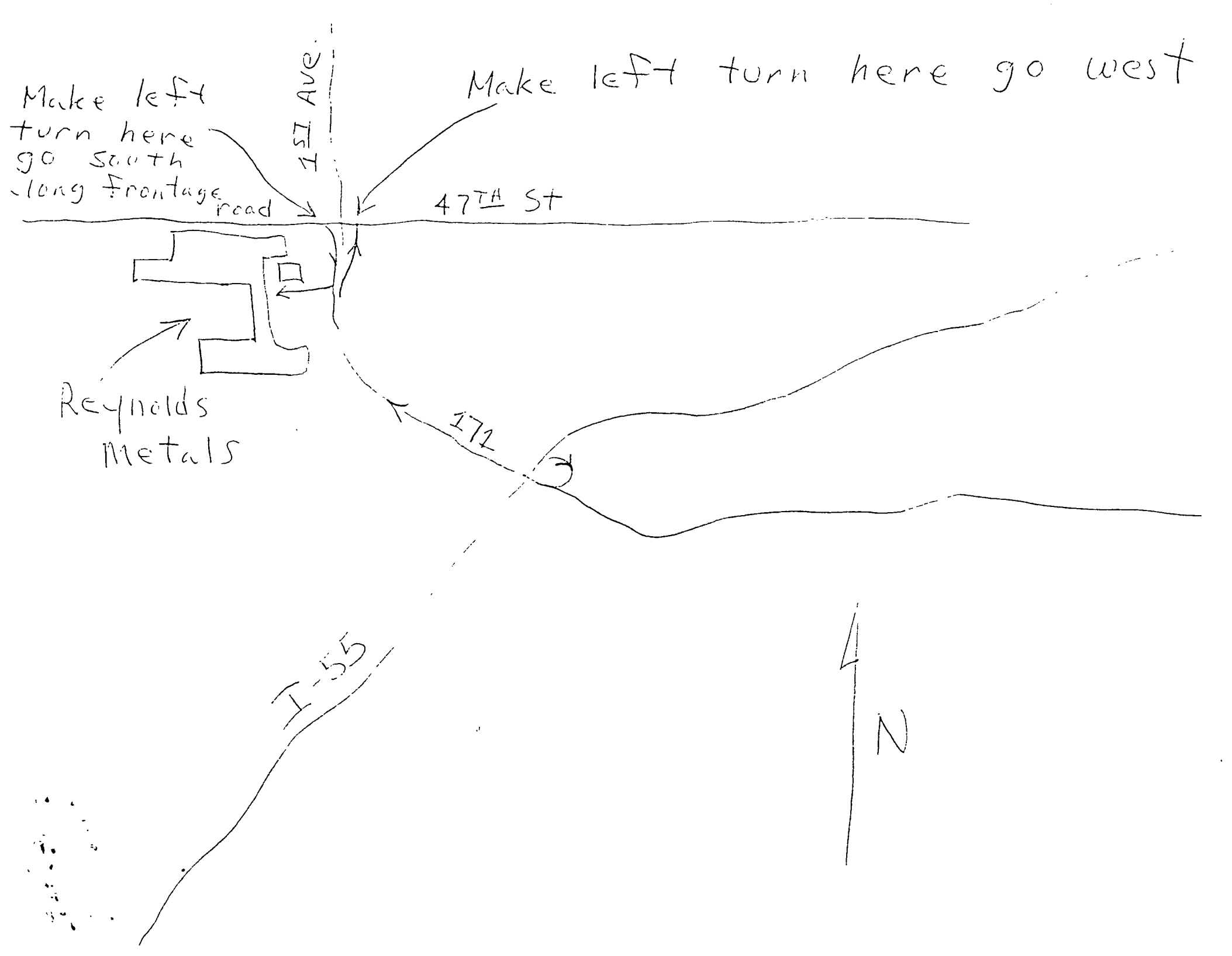
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